

Important Advances in Clinical Medicine

Epitomes of Progress — Neurosurgery

The Scientific Board of the California Medical Association presents the following inventory of items of progress in neurosurgery. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in neurosurgery which have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Neurosurgery of the California Medical Association and the summaries were prepared under its direction.

Reprint requests to: Division of Scientific and Educational Activities,
California Medical Association, 731 Market St., San Francisco, CA 94103

Microsurgical Treatment of Ischemic Cerebrovascular Disease

THE APPLICATION of microsurgical techniques to the problem of cerebral ischemia can improve collateral circulation to the brain. It is now possible to create new pathways of blood flow by surgical anastomosis of arteries that normally supply the scalp to intracranial cerebral vessels. The most common procedure produces an end-to-side anastomosis between the superficial temporal artery and a branch of the middle cerebral artery (STA-MCA). Internal diameters of the vessels involved range from 0.8 mm to 1.5 mm, necessitating the use of an operating microscope and 10-0 monofilamentous suture. More than 2,500 of these bypass operations have been done, and a recent review of published cases shows a patency rate greater than 90 percent with surgical morbidity and mortality both below 5 percent.

STA-MCA bypass is most applicable to patients with arterial obstructions or stenosis out of the reach of more classical cervical carotid artery reconstructive techniques. Indications for the operation include transient ischemic attacks (TIA) and reversible ischemic neurological deficits (RIND) occurring in patients with carotid artery occlusion,

middle cerebral artery or carotid siphon stenosis or occlusion. Follow-up studies show a pronounced enlargement of the anastomosis demonstrable on cerebral angiography with the superficial temporal artery supplying blood to most of the middle cerebral artery distribution. Regional cerebral blood flow data indicate a 20 percent increase in flow to the previously ischemic region. Clinically, a significant reduction or complete cessation of TIA's occurs in patients, and in some instances there is a reversal of ischemic neurological deficits.

In the fall of 1977 an international, multicenter, randomized study was begun to compare the long-term results of such bypass operations with platelet suppression therapy. It is hoped that this study will answer questions regarding the relationship between surgically enhanced collateral cerebral flow and death due to stroke.

In the meantime, further developments in microvascular techniques continue to emerge. Revascularization of the vertebral-basilar system is now a reality utilizing the occipital artery as a donor and establishing an anastomosis to the posterior inferior cerebellar artery. In those instances where suitable donor arteries are lacking, autogenous vein and arterial grafts are being employed as well as an occasional synthetic tube graft. With